Question	Scheme	Marks
2(a)	$\frac{x-(-3)}{12-(-3)}=0.75$	M1
	$x=8.25$ **$\underline{8.25}$** oe	A1
		(2)
(b)	$P(5\leq X<14)=P(5\leq X<12)=\frac{12-(5)}{12-(-3)}=\frac{7}{15}$	M1 A1
		(2)
(c)	$E(X)=4.5\rightarrow E(Y)=7.5$	B1
	$Var(X)=\frac{(12-(-3))^2}{12}$ [$=\frac{75}{4}$ or 18.75] or $Var(Y)=\frac{(12-(-3))^2}{48}$ [$=\frac{75}{16}$ or 4.6875]	B1
	$\frac{a+b}{2}=$'7.5' and $\frac{(b-a)^2}{12}=$'4.6875' or $(b-a)^2=\frac{225}{4}$	M1
	$(b-(15-b))^2=56.25$ oe	dM1
	$\underline{a=3.75}$ **$\underline{b=11.25}$**	A1
		(5)
		Total [9]

	Notes
(a)	M1 for correct expression or correct area on sketch. If using integration they need to get to this equivalent expression. Implied by correct answer A1 $\frac{33}{4}$ or 8.25 oe
(b)	M1 for a correct probability statement or correct ratio, e.g. $1-P(-3<X<5)$ or $1-P(X\leqslant 5)$ or $P(5\leq X<12)$. Allow $\leqslant$ instead of $<$ and vice versa. Implied by a correct answer. **NB** Do not allow $P(5\leq X<a)$ where a is >12 oe unless correct answer is given A1 $\frac{7}{15}$ or awrt 0.467
(c)	1st B1 [E(Y)] = 7.5 May be implied by a correct equation for a and b eg $\frac{a+b}{2}-3=4.5$ oe 2nd B1 correct expression for Var(X) or Var(Y). May be implied by a correct equation. 1st M1 Setting up simultaneous equations $\frac{a+b}{2}=$"their E(Y)" or their E(X) + 3 and $\frac{(b-a)^2}{12}=\frac{1}{4}$"their Var($X$)" oe 2nd dM1 dependent on first M1 being awarded. Solving simultaneously leading to an equation in just a or just b. Full method must be shown and correct if equations are incorrect. A1 both $a=\frac{15}{4}$ or 3.75 and $b=\frac{45}{4}$ or 11.25 oe **SC.** If the first 2 B marks are awarded and then 0.25 Var(Y) is used leading to a = -7.5 and b = 22.5 award B1 – mark as M0M0 A1 on epen. **Alternative:** 1st B1 7.5 2ndB1 Range of X = 15 1st M1 Var(X) = 4Var (Y) Range of X = 2 Range of Y 2nd M1 7.5 ± 7.5/2